

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Ecological Aspects of CPowertrains Application I</b>		Code <b>1010621251010620558</b>
Field of study <b>Transport</b>	Profile of study (general academic, practical) <b>(brak)</b>	Year /Semester <b>3 / 5</b>
Elective path/specialty <b>Ecology of Transport</b>	Subject offered in: <b>Polish</b>	Course (compulsory, elective) <b>obligatory</b>
Cycle of study: <b>First-cycle studies</b>	Form of study (full-time, part-time) <b>full-time</b>	
No. of hours Lecture: <b>1</b> Classes: <b>1</b> Laboratory: <b>1</b> Project/seminars: <b>-</b>		No. of credits <b>5</b>
Status of the course in the study program (Basic, major, other) <b>(brak)</b>		(university-wide, from another field) <b>(brak)</b>
Education areas and fields of science and art <b>technical sciences</b>		ECTS distribution (number and %) <b>5 100%</b>
<b>Responsible for subject / lecturer:</b> dr hab. inż. Paweł Fuć email: pawel.fuc@put.poznan.pl tel. 61) 665-2045 Faculty of Working Machines and Transportation ul. Piotrowo 3 60-965 Poznań		
<b>Prerequisites in terms of knowledge, skills and social competencies:</b>		
1	<b>Knowledge</b>	student has a basic knowledge of the environmental factors causing danger to the environment, meets the mechanisms of toxic compounds in transport and industry, know how to prevent the entry of harmful substances into the atmosphere, meets the classification of harmful compounds to human health and the safety data sheets
2	<b>Skills</b>	student is able to integrate the information, make their interpretation, draw conclusions, formulate and justify opinions, have general knowledge of safety and environmental protection in the workplace
3	<b>Social competencies</b>	student is aware of the risks associated with the issue of harmful substances into the atmosphere and is aware of the negative environmental social behavior on health and human security in transport and industry
<b>Assumptions and objectives of the course:</b> refer to environmental issues in industry, general knowledge of the risks associated with human activities now and the possible effects on future hazard classification and their determination		
<b>Study outcomes and reference to the educational results for a field of study</b>		
<b>Knowledge:</b>		
1. He knows the causes of harmful and toxic compounds - [-] 2. Familiar with the basic structure of the standard toxicity of exhaust gases and gases - [-] 3. He knows the methods of prevention of harmful emissions into the atmosphere - [-] 4. He knows the general outline of environmental determinants of mass transit - [-] 5. He has a general knowledge of the risks of industrial development on the environment - [-] 6. Has basic knowledge in the field of safety in terms of contact with toxic substances - [-]		
<b>Skills:</b>		
1. He has skills of classified categories of vehicles - [-] 2. He can analyze the factors shaping environmental performance of transport - [-] 3. He can analyze the provisions of the toxicity of exhaust gases and gases based on the literature - [-] 4. He can make a preliminary assessment of environmental risks in transport and industry - [-]		
<b>Social competencies:</b>		
1. The possibility of formation of environmental awareness in the social environment - [-] 2. Awareness of social risks in terms of environmental protection - [-]		

<b>Assessment methods of study outcomes</b>		
Test of knowledge of the formation of harmful compounds, structures standards toxicity of exhaust gases. One test during the semester		
<b>Course description</b>		
Lecture ? classification of propulsion systems, basic information of ecological transport, basic knowledge of exhaust gas cleaning systems, eco-friendly technologies in transport, the impact of macroeconomic factors on the implementation of environmentally friendly technologies in transport		
<b>Basic bibliography:</b>		
1. Stanisław Wiąckowski, Toksykologia środowiska człowieka. Wydawnictwo: Branta, 2010 ISBN: 978-83-616-6806-0		
2. Merkisz Jerzy, Mazurek Stanisław, Pokładowe Systemy Diagnostyczne Pojazdów Samochodowych. Wydawnictwa Komunikacji i Łączności WKŁ, 2006		
3. Jerzy Merkisz, Ekologiczne problemy silników spalinowych, Wyd. Politechniki Poznańskiej, Poznań 1998		
4. Merkisz J., Pielecha I., Alternatywne napędy pojazdów. Wydawnictwo Politechniki Poznańskiej, Poznań 2006.		
<b>Additional bibliography:</b>		
1. Wojciech Serdecki, Badania silników spalinowych. Wyd. Politechniki Poznańskiej, Poznań 2012		
2. Witold M. Lewandowski, Proekologiczne źródła energii odnawialnej. WNT, Warszawa 2002		
3. Zdzisław Chłopek, Ochrona środowiska naturalnego. Pojazdy samochodowe. WKŁ, Warszawa 2003		
4. Jan Gronowicz, Ochrona środowiska w transporcie lądowym. Wyd. ITE, Poznań ? Radom 2003		
<b>Result of average student's workload</b>		
<b>Activity</b>		<b>Time (working hours)</b>
<b>Student's workload</b>		
<b>Source of workload</b>	<b>hours</b>	<b>ECTS</b>
Total workload	115	5
Contact hours	49	2
Practical activities	66	3